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DOCUMENTATION RECORDS
FOR
HAZARD RANKING SYSTEM

INSTRUCTIONS: The purpose of these records is to provide a convenient way to prepare an auditable record of the data and documentation used to apply the Hazard Ranking System to a given facility. As briefly as possible summarize the information you used to assign the score for each factor (e.g., "Waste quantity = 4,230 drums plus 800 cubic yards of sludges"). The source of information should be provided for each entry and should be a bibliographic-type reference that will make the document used for a given data point easier to find. Include the location of the document and consider appending a copy of the relevant page(s) for ease in review.

FACILITY NAME: Saad Oil Company/ L & N Railroad

LOCATION: Trousdale Blvd., Nashville, Tennessee

July 29, 1982

GROUND WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected (5 maximum):

C_2 Alkylbiphenyl and C_3 and C_4 alkylnaphthalene found in both Croft Farm spring and L&N Railroad yard oil separator. Chloroform (625 ppb) found in spring at Croft Farm and in waste oil pit at J. P. Saad Oil Company. Also found in spring Carbontetrachloride, Trichloroethane, Chlorobenzene. Found at both spring and Saad Oil was benzene.

Rationale for attributing the contaminants to the facility:

Same compounds found in both Saad waste oil pit and spring and railroad yard stormwater and spring. Spring is downgradient for both surface water and groundwater routes from Saad Oil and L&N Railroad yard. Contamination also entering spring from an industrial area north of Croft Farm.

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2 ROUTE CHARACTERISTICS

Depth to Aquifer of Concern

Name/description of aquifer(s) of concern:

The aquifer of concern is the Carter and Lebanon limestones. The BigbyCannon Limestone is the surficial formation and is the formation in which the sinkhole used by Saad Oil developed. The Hermitage Formation is a confining layer between the Bigby-Cannon and the Carter limestones.

Depth(s) from the ground surface to the highest seasonal level of the saturated zone [water table(s)] of the aquifer of concern:

The ground surface is at elevation 600 feet MSL. Croft spring outcrops at top of Hermitage formation elevation 550 feet. Hermitage is about 60 feet thick. Therefore, depth from ground surface to top of Carter limestone is (600-550) + 60 = 110 feet.

Depth from the ground surface to the lowest point of waste disposal/ storage:

Sink is over 20 feet deep. Based on old topo maps.
Ref: Geologic Map and Mineral Resources Summary of the Oak Hill Quadrangle, Tennessee, by Charles W. Wilson, Jr. and Robert Miller Tennessee Division of Geology, 1973.

110 - 20 = 90 feet HRS Value = 1

Net Precipitation

Mean annual or seasonal precipitation (list months for seasonal):

48 inches per year
Ref: Climatic Atlas of U.S., 1979.

Mean annual lake or seasonal evaporation (list months for seasonal):

37 inches per year
Ref: Climatic Atlas of U.S., 1979.

Net precipitation (subtract the above figures):

11 inches HRS Value = 2

Permeability of Unsaturated Zone

Soil type in unsaturated zone:

Hermitage formation acts as a confining layer over the Carter limestone and is relatively impervious containing clays and shales.
Ref: Groundwater in the Central Basin of Tennessee by Roy Newcomb, Jr., State of Tennessee, Report of Conservation, Div. of Geology, 1958.

Permeability associated with soil type:
HRS Value of 1 based on reported rock types

Physical State

Physical state of substances at time of disposal (or at present time for generated gases):

Liquid HRS Value of 3

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3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

The wastes have been dumped into a sinkhole with no liner.

Method with highest score:

Surface impoundment; a drainage feature, no diversion, no liner, HRS Value of 3

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated:

Chloroform, Carbon Tetrachloride, Trichloroethane, Chlorobenzene and Benzene

Compound with highest score:

Chloroform Toxicity = 3 Persistence = 3
HRS Value = 18

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

8 million gallons. Inspection report by Gary Clemons 4-8-82

Basis of estimating and/or computing waste quantity:

Tennessee Dept of Solid Waste Management files.

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5 TARGETS

Ground Water Use

Use(s) of aquifer(s) of concern within a 3-mile radius of the facility:

Irrigation
HRS Value of 1

Distance to Nearest Well

Location of nearest well drawing from aquifer of concern or occupied building not served by a public water supply:

A. S. Lankford, 300 Wheeler St., 48 foot well, garden irrigation, well top elevation 550 feet msl. Bottom of well 500 feet msl. Estimated to be in the Carter Limestone.
L. G. Newman, 522 Paragon Mills, 98 foot well, pump intake at 48 foot, lawn irrigation well top elevation about 500 ft. msl. Bottom of well 400 ft. msl. Bottom is estimated to be in the Lebanon Limestone.

Distance to above well or building:

2500 feet to Lankford well HRS Value = 3
3000 feet to Newman well

Population Served by Ground Water Wells Within a 3-Mile Radius

Identified water-supply well(s) drawing from aquifer(s) of concern within a 3-mile radius and populations served by each:

None

Computation of land area irrigated by supply well(s) drawing from aquifer(s) of concern within a 3-mile radius, and conversion to population (1.5 people per acre):

A. S. Lankford's garden 1 acre (assumed)

Total population served by ground water within a 3-mile radius:

Using agriculture conversion
Population = 1.5 people
HRS Value = 1

SURFACE WATER ROUTE

1 OBSERVED RELEASE

Contaminants detected in surface water at the facility or downhill from it (5 maximum):

Yes; at spring, see groundwater for description

Rationale for attributing the contaminants to the facility:

see groundwater

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2 ROUTE CHARACTERISTICS

Facility Slope and Intervening Terrain

Average slope of facility in percent:

Name/description of nearest downslope surface water:

Average slope of terrain between facility and above-cited surface water body in percent:

Is the facility located either totally or partially in surface water?

Is the facility completely surrounded by areas of higher elevation?

N/A

1-Year 24-Hour Rainfall in Inches

Distance to Nearest Downslope Surface Water

Physical State of Waste

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3 CONTAINMENT

Containment

Method(s) of waste or leachate containment evaluated:

N/A

Method with highest score:

4 WASTE CHARACTERISTICS

Toxicity and Persistence

Compound(s) evaluated

Chloroform see groundwater

Compound with highest score:

Chloroform Toxicity = 3 Persistence = 3
HRS Value = 18

Hazardous Waste Quantity

Total quantity of hazardous substances at the facility, excluding those with a containment score of 0 (Give a reasonable estimate even if quantity is above maximum):

8 million gallon based on Tennessee File as reported in groundwater section.

Basis of estimating and/or computing waste quantity:

Tennessee Files
HRS Value = 8

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5 TARGETS

Surface Water Use

Use(s) of surface water within 3 miles downstream of the hazardous substance:

Croft spring was used for drinking water by Croft family. Spring will be used for recreation in the future. Cumberland River is sole source of Nashville's drinking water. Main treatment plant is 1/2 mile downstream of Mills Creek. Saad site is 9.3 miles up Mills Creek from Cumberland River. Water is used for drinking. HRS Value = 3.

Is there tidal influence?

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

no sensitive environments identified

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

Distance to critical habitat of an endangered species or national wildlife refuge, if 1 mile or less:

Population Served by Surface Water

Location(s) of water-supply intake(s) within 3 miles (free-flowing bodies) or 1 mile (static water bodies) downstream of the hazardous substance and population served by each intake:

Only the Croft farm used the resource.
Population is therefore only one or two families.
Population estimate 8 people. These people are at the site therefore distance is less than 2000 feet.
HRS Value 10 from matrix.
current population is two people.

Computation of land area irrigated by above-cited intake(s) and conversion to population (1.5 people per acre):

No irrigation

Total population served:

Name/description of nearest of above water bodies:

Distance to above-cited intakes, measured in stream miles.

AIR ROUTE

1 OBSERVED RELEASE

Contaminants detected:

No release

Date and location of detection of contaminants

Methods used to detect the contaminats:

Rationale for attributing the contaminants to the site:

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2 WASTE CHARACTERISTICS

Reactivity and Incompatibility

Most reactive compound:

Most incompatible pair of compounds:

Toxicity

Most toxic compound:

Hazardous Waste Quantity

Total quantity of hazardous waste:

Basis of estimating and/or computing waste quantity:

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3 TARGETS

Population Within 4-Mile Radius

Circle radius used, give population, and indicate how determined:

0 to 4 mi 0 to 1 mi 0 to 1/2 mi 0 to 1/4 mi

Distance to a Sensitive Environment

Distance to 5-acre (minimum) coastal wetland, if 2 miles or less:

Distance to 5-acre (minimum) fresh-water wetland, if 1 mile or less:

Distance to critical habitat of an endangered species, if 1 mile or less:

Land Use

Distance to commercial/industrial area, if 1 mile or less:

Distance to national or state park, forest, or wildlife reserve, if 2 miles or less:

Distance to residential area, if 2 miles or less:

Distance to agricultural land in production within past 5 years, if 1 mile or less:

Distance to prime agricultural land in production within past 5 years, if 2 miles or less:

Is a historic or landmark site (National Register or Historic Places and National Natural Landmarks) within the view of the site?

DIRECT CONTACT ROUTE

1 OBSERVED INCIDENT

Are incidents of human or animal injury, illness or death reported:

None HRS Value = 0

2 ACCESSIBILITY

Accessibility of humans and animals:

Contaminated spring flow through a park which is under construction and access is not currently restricted.
HRS Value of 3

3 CONTAINMENT

Are the wastes properly contained:

Wastes were dumped into a sinkhole and covered with two feet of gravel and is thus not properly protected. HRS Value = 15

4 WASTE CHARACTERISTICS

What is the compound of concern and its toxicity:

Chloroform Toxicity of 3
HRS Value = 3

5 TARGETS

What is the population within one mile radius of the site:
20,368 people estimated below
HRS Value = 5

How was population determined:

Area within 1 mile radius; $(5280 \text{ ft})^2 \times \pi \div 43560 \text{ ft}^2/\text{acre} = 2010$ acres
Assumed housing density 4 housing units per acre.
2010 acres x 4 = 8040 x 3.8 persons/house = 30,552 people
A railroad switching yard takes up about 1/3 of the 1 mile circle around the site therefore the population is only 2/3 of the complete circle estimated population.

Distance to a critical habitat and name of habitat:
None
HRS Value = 0

Facility Name: John P. Saad/ L&N

Location: Trousdale Blvd., Nashville, Tennessee

EPA Region: IV

Person(s) in Charge of the Facility: J. P. Saad Oil Company and the Louisville and Nashville Railroad

Name of Reviewer: Jim Aton Date: 7-29-82

General Description of the Facility:

(For example: landfill, surface impoundment, pile, container; types of hazardous substances; location of the facility; contamination route of major concern; types of information needed for rating; agency action, etc.)

A waste oil recycler which dumped wastes into a sinkhole on site and a railroad maintenance and switching yard with spills. The site is located in south central Nashville, south of the Cumberland River. Waste oil, solvent and heavy metal have been identified. Need additional sampling in Mills Creek. A park is planned along the spring which drains the site resulting in a direct contact problem.

Scores: S_M = 21.13 (S_{gw} = 11.97 S_{sw} = 34.55 S_a = 0)

S_{FE} = Not scored

S_{DC} = 62.50

HRS COVER SHEET

GROUND WATER ROUTE WORK SHEET

	Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1	Observed Release	0 45	1	0	45	3.1
	If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.					
2	Route Characteristics					3.2
	Depth to Aquifer of Concern	0 (1) 2 3	2	2	6	
	Net Precipitation	0 1 (2) 3	1	2	3	
	Permeability of the Unsaturated Zone	0 (1) 2 3	1	1	3	
	Physical State	0 1 2 (3)	1	3	3	
	Total Route Characteristics Score			8	15	
3	Containment	0 1 2 (3)	1	3	3	3.3
4	Waste Characteristics					3.4
	Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	
	Hazardous Waste Quantity	0 1 2 3 4 5 6 7 (8)	1	8	8	
	Total Waste Characteristics Score			26	26	
5	Targets					3.5
	Ground Water Use	0 (1) 2 3	3	3	9	
	Distance to Nearest Well/Population Served	0 4 6 (8) 10 12 16 18 20 24 30 32 35 40	1	8	40	
	Total Targets Score			11	49	
6	If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			264	57,330	
7	Divide line 6 by 57,330 and multiply by 100	S_{gw} = 11,97				

SURFACE WATER ROUTE WORK SHEET

	Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1	Observed Release	0 45	1	45	45	4.1
	If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.					
2	Route Characteristics					4.2
	Facility Slope and Intervening Terrain	0 1 2 3	1		3	
	1-yr. 24-hr. Rainfall	0 1 2 3	1		3	
	Distance to Nearest Surface Water	0 1 2 3	2		6	
	Physical State	0 1 2 3	1		3	
	Total Route Characteristics Score			X	15	
3	Containment	0 1 2 3	1	X	3	4.3
4	Waste Characteristics					4.4
	Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18	
	Hazardous Waste Quantity	0 1 2 3 4 5 6 7 (8)	1	8	8	
	Total Waste Characteristics Score			26	26	
5	Targets					4.5
	Surface Water Use	0 1 2 (3)	3	9	9	
	Distance to a Sensitive Environment	(0) 1 2 3	2	0	6	
	Population Served/Distance to Water Intake Downstream	0 4 6 8 (10) 12 16 18 20 24 30 32 35 40	1	10	40	
	Total Targets Score			19	55	
6	If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5	45 x 26 x 19		22230	64,350	
7	Divide line 6 by 64,350 and multiply by 100	S_{sw} = 34.55				

AIR ROUTE WORK SHEET

	Rating Factor	Assigned Value (Circle One)	Multiplier	Score	Max. Score	Ref. (Section)
1	Observed Release	0 45	1	0	45	5.1
	Date and Location:					
	Sampling Protocol:					
	If line 1 is 0, the S = 0. Enter on line 5. If line 1 is 45, then proceed to line 2.					
2	Waste Characteristics					5.2
	Reactivity and Incompatibility	0 1 2 3	1		3	
	Toxicity	0 1 2 3	3		9	
	Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
	Total Waste Characteristics Score				20	
3	Targets					5.3
	Population Within 4-Mile Radius	0 9 12 15 18 21 24 27 30	1		30	
	Distance to Sensitive Environment	0 1 2 3	2		6	
	Land Use	0 1 2 3	1		3	
	Total Targets Score				39	
4	Multiply 1 x 2 x 3			0	35,100	
5	Divide line 4 by 35,100 and multiply by 100 S_a = 0					

	S	S^2
Groundwater Route Score (S_{gw})	11.97	143.35
Surface Water Route Score (S_{sw})	34.55	1193.70
Air Route Score (S_a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		1337.05
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		36.56
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73$		S_M = 21.15

WORKSHEET FOR COMPUTING S_M